

Patent claims

1. Method for the production of non-woven fabrics, in which a lyotropic solution of cellulose carbamate in N-methylmorpholine-N-oxide (NMMNO) is spun into a plurality of filament yarns by means of extrusion through a nozzle block containing at least 20 openings via an air gap into a regenerating bath, said filament yarns being intermingled subsequently by being subjected to a flow with gaseous medium and/or fluid.
2. Method according to claim 1,

characterised in that a nozzle block with at least 10,000 openings is used.
3. Method according to one of the claims 1 or 2,

characterised in that the ratio of length to diameter of the nozzles is from 1 to 20.
4. Method according to one of the preceding claims,

characterised in that the width of the air gap between nozzle and regenerating bath is 5 to 150 mm, in particular 10 to 50 mm.
5. Method according to one of the preceding claims,

characterised in that the filament yarns are guided downwards after spinning into a slot-shaped funnel, the intermingling with the gaseous medium and/or fluid being effected at the outlet of the funnel.
6. Method according to the preceding claim,

characterised in that a further intermingling of the filament yarns is achieved by a shaking movement of the funnel.

7. Method according to one of the preceding claims,

characterised in that air and/or water are used as gaseous medium and/or fluid.

8. Method according to one of the preceding claims,

characterised in that the filament yarns are laid on a conveyor belt after the intermingling.

9. Method according to the preceding claim,

characterised in that a further intermingling of the filament yarns is achieved by a shaking movement of the conveyor belt.

10. Method according to one of the preceding claims,

characterised in that the cellulose carbamate proportion of the lyotropic solution is at least 20% by weight, in particular 22 to 27% by weight, relative to the solution.

11. Method according to one of the preceding claims,

characterised in that the lyotropic solution is produced by swelling of the cellulose carbamate in a 40 to 70%, in particular a 50% solution of NMMNO in water and subsequent removal of the water up to a ratio of NMMNO to water between 80 : 20 and 90 : 10.

12. Method according to one of the preceding claims,

characterised in that the regenerating bath comprises a solution of NMMNO in water with an NMMNO proportion of 0.5 to 25% by weight, in particular 5 to 15% by weight, relative to the solution.
13. Method according to one of the the preceding claims,

characterised in that the extrusion is effected at a temperature between 80 to 110°C, in particular 85 to 95°C.
14. Method according to one of the preceding claims,

characterised in that the non-woven fabric is subsequently washed, pressed and dried.
15. Method according to the preceding claim,

characterised in that the washing is effected by a water jet at high pressure.
16. Method according to one of the preceding claims,

characterised in that the cellulose carbamate is regenerated into cellulose in a regenerating bath.
17. Method according to the preceding claim,

characterised in that the regenerating bath comprises 0.3 to 1% by weight sodium hydroxide in water and the regeneration is effected at a temperature of 60 to 95°C.
18. Method according to one of the claims 16 or 17,

characterised in that the regeneration is implemented between extrusion and intermingling.

19. Method according to one of the claims 16 or 17,

characterised in that the regeneration is implemented after the intermingling.

20. Non-woven fabric comprising a random orientation of filament yarns made of cellulose carbamate.

21. Non-woven fabric according to claim 20,

characterised in that the filament yarns have a strength of at least 60 cN/tex.

22. Non-woven fabric according to claim 20 or 21,

characterised in that the non-woven fabric can be produced according to the method according to one of the claims 1 to 15.

23. Non-woven fabric comprising a random orientation of filament yarns made of regenerated cellulose.

24. Non-woven fabric according to claim 23,

characterised in that the residual N-content is from 0.3 to 0.5%, in particular 0.1 to 0.2%.

25. Non-woven fabric according to one of the claims 23 or 24,

characterised in that the non-woven fabric has a pore structure with a porosity of 1 to 10%.

26. Non-woven fabric according to one of the claims 23 to 25,

characterised in that the non-woven fabric has a specific internal surface between 20 and 50 m²/cm³, measured by means of small angle x-ray scattering (SAXS).

27. Non-woven fabric according to one of the claims 23 to 26,

characterised in that the non-woven fabric can be produced with the method according to one of the claims 16 to 19.

28. Use of the non-woven fabrics according to one of the claims 20 to 27 in medicine, in particular as operating sheets, bed sheets, surgical dressings, gauzes or cotton wool pads.

29. Use of the non-woven fabrics according to one of the claims 20 to 27 as hygiene materials or as household wipes.

30. Use of the non-woven fabrics according to one of the claims 20 to 27 as decorative non-woven fabrics, in particular tablecloths, serviettes or curtains.

31. Use of the non-woven fabrics according to one of the claims 20 to 27 as non-woven liners in the clothing industry.

32. Use of the non-woven fabrics according to one of the claims 20 to 27 as reinforcing mats or isolating jackets in the building industry.

33. Use of the non-woven fabrics according to one of the claims 20 to 27 as reinforcing material for fibre-reinforced thermoplastic and duroplastic plastic materials.